

The University of Chicago

THE WICKSELLIAN SCHOOL

A CRITICAL STUDY OF THE DEVELOPMENT OF
SWEDISH MONETARY THEORY, 1898-1932

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE
SOCIAL SCIENCES IN CANDIDACY FOR THE
DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF ECONOMICS
JUNE, 1942

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BENJAMIN CAPLAN

CHICAGO, ILLINOIS

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INTRODUCTION

It is unfortunate that for a long time language barriers made the development of the Wicksellian School in Sweden a closed book to the vast majority of American and English economists. For it is a unique intellectual phenomenon. While recent translations of Wicksell, Lindahl and Myrdal have now made parts of this development accessible, a coherent picture is still lacking.

Between 1898, the year in which Wicksell published his famous Geldzins und Gueterpreise, and 1931, the year in which the Swedish original of Myrdal's Monetary Equilibrium appeared, there took place in Sweden a self-contained evolution in monetary theory. This "cumulative process" of the Wicksellian system reached levels far beyond those outside, certainly until 1936 when Keynes's General Theory appeared. Today, much of the conceptual apparatus which Wicksell introduced and his followers refined, seems dated, but, nevertheless, his basic approach is still very timely--the attempt to develop an explanation of process in terms of the interrelations of the economic variables at a point of time.

This study traces the various stages in this evolution. The study stops with 1932 because the unity of Swedish monetary theory ended then. Outside influences were becoming stronger, in part because the traditional Wicksellian approach had reached, as it would seem, the limit of its usefulness. Swedish monetary thought after 1932 was no longer Wicksellian or even neo-Wicksellian but had become para-Wicksellian.

THE WICKSELLIAN THEORY

Basic to Wicksell's approach was his theory of monetary equilibrium. It was set up to serve two purposes: (1) to isolate the influences from the side of money; (2) to furnish the basis of a policy or plan. He began to write in a period in which the international price level had undergone a drastic fall, an event which had inspired, then as always, the search for remedies.

In Wicksell's search for a "rational" policy, he inevita-

bly had to examine the factors which determine the price level and changes in the price level. Wicksell's approach in Geldzins embraced the following points:

(1) He did not regard himself as a revolutionary innovator in monetary theory but rather as one who extended or completed existing views on the Quantity Theory and in particular Ricardo's views.

(2) The causes that affect the general level of prices are to be found in the money market; all other causes affect relative prices.

(3) Changes in the available supply of the metals which are used for monetary purposes have no direct effect on the level of prices.

(4) The strength of the Quantity Theory, as he saw it, lay in the fact that there was a relationship between the quantity of money and the demand and supply of goods in general, and hence between the quantity of money and the price level. Its weakness was that its validity rested on ceteris paribus.

(5) For Wicksell, a major (if not the primary) function of money was to act as a medium of exchange. In so far as it acted as a store of value it was to be treated as a postponed or delayed medium of exchange. The problem, in essence, which Wicksell set himself was the determination of the transactions-demand for money.

(6) Since Wicksell was an "Austrian" in his capital theory, he considered the strategic factor in the economy to be the interest rate, (a) because it determined the disposition of the capital fund, and (b) because it was the price which was paid for the use of money. By the interest or market rate Wicksell meant the rate paid for long-term money loans which is, however, related to the short-term rate.

A fall in the interest rate, cet. par., acts as a stimulus to increased investment. But on the other hand there was the fact, as Tooke pointed out, that periods of low or falling prices were accompanied by low or falling interest rates and mutatis mutandis for periods of high or rising prices.

It was necessary to reconcile theory with fact. The reconciliation was accomplished by the assumption--for it would not be true to say that Wicksell had proved it, although he thought he had done so--that the market for real capital was separate and

independent of the market for money. In the former market the "natural" or "real" rate was determined, i.e., the equilibrium price which would be established if the real capital were loaned in natura. In the latter market there is determined the "loan rate," or the "interest rate," or the market rate which must be paid for the use of money.

In a monetary economy the entrepreneurs do not obtain their control over the free capital directly, but they obtain control over purchasing power and then they obtain the real capital. It thus becomes possible for them to compare and contrast the "real" terms with the "money" terms. There is no necessity for the two rates to coincide since changes in the natural rate take place continuously while changes in the interest rate take place discontinuously. Consequently, the interest rate may diverge from the natural rate, and it is this divergence which serves to explain price movements.

Such a divergence between the two rates will lead (7) to a "cumulative process" either upwards or downwards in the price level. If the natural rate is above the interest rate, then this will stimulate the entrepreneurs to borrow more money from the banks and to increase their demand for the factors of production. This will increase incomes and hence the prices of final goods. This will maintain the increased profitability brought about originally by the divergence between the two rates and thus cause the process to be repeated. A fundamental assumption is that decisions are based upon present prices.

To eliminate this cumulative process all that is necessary (8) is that the market rate be restored to a level that is normal relative to the natural rate (not necessarily equal to the natural rate). It will not restore the price level to its previous level, for to do so would require an interest rate above the natural rate. It would be an equilibrium position because the equilibrium of the price level is a "neutral" equilibrium.

This leads to Wicksell's famous conditions for monetary equilibrium. As presented in Geldzins, monetary equilibrium is said to prevail when (1) the interest rate is normal (not necessarily equal) relative to the natural rate, i.e., it is neutral relative to the price level; and hence (2) the price level is stable. Later, in his Lectures II (first published in 1906), he added a third condition of monetary equilibrium--(3) the demand

for and supply of savings are equal.

A "Neutral" Interest Rate and the Price Level

A. The Wicksell-Davidson Controversy, 1906-1909

Wicksell was aware that his "natural rate" concept was vague, but he considered that the use of it as a tool of analysis was justified since he thought that it led to a sufficiently clear criterion for monetary policy, viz., a stable price level. What Wicksell was asserting was that in a free, barter economy, a certain interest rate would be established which, if it prevailed in a monetary economy, would be neutral with respect to absolute prices, i.e., would not cause any upward or downward movements in the price level. He was also asserting the converse of this proposition, viz., that if there were no movements in the price level this signified that the interest rate was normal.

The first major criticism of Wicksell's Theory was advanced by Professor Davidson in 1906. The point at issue was the effect of technological progress upon the policy of a stable price policy. Davidson contended that to maintain monetary equilibrium, prices should fall with a fall in the cost of production, and the consequent increase in output. The policy of a stable price level would, he said, require a lowering of the interest rate when prices began to fall. This would make it profitable for entrepreneurs to expand and this would bring about the "cumulative process" Wicksell was striving to avoid.

It must not be thought that Wicksell was unmindful of technical progress. His statement that the natural rate was continually changing and his distinction--a commonplace by his time--between two classes of causes affecting prices, (1) those from the side of money, and (2) those from the side of goods, show that he was aware of the problem.

But with regard to technical progress he argued as follows: (1) a reduction in the costs of production of some goods might cause other goods to rise slightly in price and the reduced-cost-of-goods to fall slightly in price so that the net effect might be no change in the average; (2) the monetary system was assumed so highly elastic that the volume of money could be increased without difficulty, and this could thus maintain the price-level constant; and (3) an increase in the volume of goods would be a

small increase and would cause but a small decline in prices and this decline would not be cumulative. These three propositions are alternative propositions. In general, with respect to changes in the cost of production, he assumed in Geldzins that they could affect relative prices but not the general level of prices.

The debate between Davidson and Wicksell lasted until 1909. It ended on a certain note of confusion. Wicksell was determined in his refusal to concede the validity of Davidson's point that an increase in productivity should lead to a falling price level instead of a stable one. He was assuming, he said, unlimited elasticity of the currency, and if any fall in prices occurred with the increase in output, ergo, it was contrary to his assumptions. Hence, his argument was unaffected by Davidson's point because it must imply inadequate elasticity of the monetary supply. The crux of the matter would appear to be the means by which the increased quantity of money necessary to offset the increased supply of goods would get into the hands of the public. Since the increase is to be mediated through the banking system, what would the appropriate bank-rate policy be?

How does the increase in productivity come about? Wicksell had pointed out that this case is reducible to two subcases: (1) where the increase in productivity can come about only in the future, i.e., requiring a more or less extensive period of investment; (2) where the increase in productivity is immediately available. (The second case might come about through a change in the organization of labor, e.g., the introduction of the stretchout system, or the speedup, etc.) In (1) we have the further problem of what the appropriate bank policy would be through the transitional period; and this, as Wicksell pointed out, would depend upon the anticipations of the business men.

a) If they anticipated that present prices would be future prices, then in order to present an upward cumulative process from coming into operation, the market rate would have to be raised. Consequently there would be no increase in the quantity of money and the entrepreneurs would shift over from the older process to the newer process in an orderly fashion.

The output of final goods would remain unchanged until the new methods would become operative; and since the quantity of money remains constant, i.e., effective money, then the price level will be constant. When the larger output becomes available,

what then? The entrepreneurs are counting on constant prices, but the quantity of money has not changed, hence prices must fall, but if prices fall, the profit-rate will be less than the market rate which will now be overnormal, hence a downward cumulative process will start, unless the market rate is lowered to its previous level. If a price fall is to be avoided, the market rate would have to be lowered before the increased output was made available. This, however, would start an upward cumulative process. In this case, then, Davidson was right when he argued that a fall in prices would maintain equilibrium, provided, however, that the market rate was lowered simultaneously.

b) If lower prices are anticipated, then it is unnecessary to raise the interest rate and then lower it to maintain equilibrium. It is unlikely, however, that the entrepreneurs would anticipate a fall in prices equal to the fall in costs.

In subcase (2) where the increased output is immediately or almost immediately available, any attempt to prevent a fall in prices would necessitate a lowering of the interest rate which would then increase the quantity of money and cause the entrepreneurs to bid competitively for labor and capital. Here, again, Davidson was right. But it might be argued that, until prices have ceased falling, the profit rate exceeds the market rate, and hence there is some inducement to expand. It would depend on the character of the market mechanism. It is fairly clear that both were thinking in terms of a fairly flexible competitive market and full employment, certainly flexible with respect to prices of goods whatever might be the situation with respect to e.g., the wages of labor. Thus Davidson argued in terms of the stabilization of wage-rates and the fluctuation of prices. If, then, the market is flexible, the fall in prices will be instantaneous, and the problem is solved. If the fall in prices is gradual, because of accumulation of stocks or for similar reasons, the interest rate would have to be raised, and then lowered with each subsequent fall in prices. Davidson was wrong in asserting it would be undesirable to reduce the interest rate to maintain equilibrium, but his error rose from the fact that he did not appreciate fully the sequence of events.

On the whole, then, it would appear that Davidson had the better of the argument. Where Wicksell went astray was in his concept of a currency of "unlimited elasticity" and from his failure

to investigate the measures necessary to increase the quantity of money in order to prevent a price fall. He appeared to visualize an automatic increase in the quantity of money corresponding to the increase in the quantity of goods. Now, an automatic increase in the quantity of money could occur in the case of, e.g., a general increase in the quantities of the factors of production, but in his case, this did not occur, factor-prices and employment remained the same, and hence there would be no increase in the quantity of money unless the profit rate was in excess of the market rate. If the market rate were normal, the quantity of money would not increase and prices must fall when output increased within the framework of Wicksell's own system.

B. The Problem of Inflation

1. The Monetary Analysis of Professor Davidson

Sweden although a neutral during World War I was subjected to the problem of a rising price level. Debate raged between the bankers and the economists over the role of banking policy as an aid in stopping the rise in prices. One of the major issues was the effectiveness of the interest rate as a weapon for controlling the price level and the quantity of money. Another was the extent to which the rise in prices could be attributed to inflationary pressures.

The bankers argued that raising the interest rate was (1) powerless to stop the rise in prices; and (2) it was an undesirable weapon to use because (a) the profitability of war trade was so great that it could not be seriously affected by a rise in the interest rate; and (b) such a rise would hurt those businesses not engaged in war trade.

This was a major blow at the Wicksellian position for it implied that monetary control via the interest rate was hopeless--at least during the war. Professor Davidson made the major case for the economists.

In the course of the discussion, which lasted a number of years, Davidson made the following points under the assumption of full employment: (1) the lowering of the interest rate below its normal level does not in general lead to the utilization of profit-opportunities which could not be utilized before the decrease in the interest rate. (2) If the interest rate is raised

from an undernormal level to the normal level, this in general does not lead to making unprofitable profit-opportunities which could be utilized while the interest rate was undernormal. Hence, so far as policy was concerned, normalizing the interest rate would not destroy the least profitable enterprises. It would stop the increase in the quantity of money and hence remove this factor making for rising prices.

But this raises the question of the extent to which price-rises can be considered inflationary and hence to be prevented. Wicksell's position was that the price level was to be kept stable under all circumstances. Davidson had already made the point that in the case of technological progress the price level should fall to preserve monetary equilibrium. He now broadened his analysis.

Davidson distinguished between four primary cases of price rises and one secondary case. The four primary cases are the following: (D1) the rise in prices occurs because of an increase in the quantity of money. The increase in the quantity of money takes place directly or via a lowering of the interest rate. (D2) The rise in prices occurs because of a reduction in output. (D3) The rise in prices occurs because of an increase in taxes on sales or production. (D4) The rise in prices takes place because of the development of monopoly. But in addition if prices continued to rise for some time, then (D1a) the continuing rise would influence anticipations and anticipations would become a powerful factor reinforcing the rise in prices.

The rise in prices in cases (D2), (D3), (D4), would be considered by Professor Davidson as "desirable" in the sense that they reflect changes in the "objective" situation. Hence they do not disturb monetary equilibrium but rather preserve it. No change in the interest rate is thus necessary.

Cases (D1) and (D1a) are cases of "inflationary" price rises. Inflation, as Davidson envisaged the term, was the change in the relative shares of the national output brought about by monetary action causing a rise in prices. This "monetary" rise of prices could come about either (1) through an undernormal interest rate, thus causing an increase in the quantity of money; or (2) through a direct increase in the quantity of money which in turn could come about (a) as a result of the issue of inconvertible paper money by the state or the borrowing of notes from the central bank for state purposes; (b) the existence of infla-

tion in other lands and its spread; (c) in other ways. A normal interest rate would eliminate the inflation of (1) but would not eliminate the inflation of (2) although it would prevent any further progress of the inflation. To eliminate the inflation of (2) an "overnormal" rate would be necessary. The use of an overnormal rate would bring with it many difficulties which would be greater, the greater the desired reduction in the price level.

2. The WickSELL-ÅKerman Controversy

Davidson's extensive and subtle analysis indicates clearly the complex difficulties involved in the application of a normal interest rate policy. Nor had he exhausted all the possible ramifications of the problem. The problems stimulated others to tackle the same problems, and what is of particular interest they stimulated a new generation of Swedish economists who were to come to prominence in the postwar period.

Gustaf Åkerman, one of the new generation, re-examined the problem of inflation in 1921. WickSELL, in Geldzins, had maintained that every rise in prices was due to an undernormal interest rate acting on the demand for money. Hence, if gold is produced, it will act to increase prices by sending interest rates down, which in turn increases the borrowings of entrepreneurs, who expand their demand for the factors, etc. In his Lectures and in his debate with Davidson, WickSELL considered that the new gold might act directly on prices through the increased demand of the gold producers for goods. What Åkerman sought to do was to re-establish WickSELL's first position in Geldzins.

The essence of Åkerman's position was that as long as the interest rate was normal, inflation was impossible. Hence, inflation could not operate directly in the price level but only indirectly via an undernormal interest rate. He based his conclusion on the following type of analysis: in an economy a certain rate of saving takes place which, cet. par. will lower the natural rate. Suppose, however, that the Government requires for unproductive purposes an amount equal to the annual saving. What are the consequences? They will depend upon the method of financing.

Assume that the currency consists solely of inconvertible paper money issued by the government, and that the government issues an additional amount to cover its new requirements. The mon-

etary savings accumulate in the banks. This, according to Åkerman, forces the interest rate down but since the natural rate remains the same because the new saving has not gone into capital formation, inflation is brought about to the limit of the surplus cash of the banks. If the government had taxed or borrowed no inflation would have resulted. Similarly, if the banks had kept their interest rates normal, inflation would have been prevented. But the banks, Åkerman said, were forced to lower their interest rates, and this caused what he called forced inflation.

Voluntary inflation would come about according to Åkerman in a banking system where gold reserves are less than 100 per cent and the banks decide to lower the reserve ratio which they are currently maintaining. This means lowering the interest rate below its normal level and this brings about an inflation. It was also possible to conceive of an inflation which was half-voluntary, e.g., if the state issues paper money and the banking system maintains fractional reserves. If the increase in reserves causes the banks to lower their interest rates, the inflation would be half-voluntary. In addition to these terms, he also introduced the concepts of objective and subjective inflation, the former coming about through an undernormal interest rate, the latter, through anticipations brought about by a sustained rise in prices. Hence, there would be an objective natural rate and a subjective natural rate.

The ensuing discussion between Wicksell and Åkerman did not clarify the problem to any considerable extent. Wicksell wondered at the use of the term, forced inflation. As he saw it, the banks pursued their normal lending policies and this plus the new paper money caused the inflation.

The major analysis of the problem was by Professor Davidson. He pointed out that Åkerman's case rested on the following: (1) that the government did not require more than the annual saving; (2) that it issued new money; (3) that the new money is used for consumption purposes; (4) for the increase of the new money to produce inflation, it is necessary that no withdrawal of a corresponding quantity of money from circulation takes place; (5) that the maintenance of the interest rate at a normal level is a guarantee that the monetary saving causes an amount of money to be retired from circulation, equal to the increase in paper money.

For these conditions to be fulfilled, Davidson said that

the state must borrow from the central bank and then repay with an issue of 'new money. As long as the central bank kept its rate normal inflation could be avoided. If the state issued the money directly, the central bank would have to maintain an overnormal rate in order to withdraw from circulation enough old money to counterbalance the new money. In the first case, all Åkerman was saying was that if the central bank's rate was normal, cet. par., no inflation could occur from the issue of bank money. In the second case, the need of an overnormal rate refuted his thesis that a normal rate was sufficient. But the trouble was the ambiguity of the term, normal rate.

How was it possible for so much disagreement to exist when all the participants operated within the same terminological universe? All would agree that they were using the Wicksellian system in their respective analyses of the term "inflation." One can understand the difficulty of communicating ideas when the participants operate with symbols from different terminological and ideological universes. But in the controversy between Åkerman on the one hand, and Wicksell and Davidson on the other hand, communication should have been relatively easy, since all three spoke a common language. The debate revealed the fundamental weaknesses of the Wicksellian system, the vagueness of its central concepts of the natural and the normal rates, and the ambiguity which comes from operating with the model of a real economy in analyzing the problems of a monetary economy. For all three the term, inflation, denoted a rise in prices due to "monetary" causes. The disagreement was over the cause of the rise in prices, i.e., whether it was due indirectly to an "undernormal" interest rate or directly to an increase in the quantity of money. Since Åkerman's analysis rested on very extreme assumptions, as Davidson had pointed out, Wicksell's position was still valid, that a rise in prices could occur, (1) indirectly because of an undernormal interest rate, and/or directly because of (2) an increase in the quantity of money.

C. Lindahl's Synthesis of Price Policy

Lindahl's work (which appeared in 1929) synthesized the discussion over the problem of the correct price policy. It is interesting to note that he originally intended to work out the

implications of Wicksell's monetary program but ended up by adopting and working out the implications of the Davidsonian program. Wicksell, to the last, maintained the correctness of a stable price policy although he was finally willing to concede the possibility of an exception where, as in wartime, a shortage of goods develops.

It is significant also that Lindahl discarded the criterion of a normal interest rate for while he assumed that the interest rate was always normal actually he set up another set of criteria, viz., (1) to assure confidence and the certainty of justice within the economic sphere by a policy consistently directed toward a specified objective; and (2) to diminish the risks of borrowers and lenders by regulating the price level in such a way that the effects of unforeseen events are neutralized.

Since the first maxim is, so to speak, self-implied Lindahl deals mainly with the implications of the second maxim. The second maxim is a Wicksellian one since the latter also sought to preserve justice between creditors and debtors. Lindahl assumed that the major rigidity in his economy is the amount of long term debt while he also assumed that the interest rate is variable.

The second maxim would have monetary policy seek to maintain the intended content of contracts. Since there are a multiplicity of contracts a choice is necessary. Lindahl chose as the relevant contract that which mediates the saving of the economy into real capital because of the dominant role played in our economy by capital formation. If the borrower-entrepreneur is protected from nonfulfilment of the terms of his contract this protects the lender-saver. Hence, the price policy must be set up to stabilize the position of the borrower-entrepreneur.

The entrepreneur-borrower considers that the future net yield of the investment will at least suffice to pay the interest on the loan, i.e., that the capital value of the capital good is at least equal to the amount of the debt. But the yield of the investment depends on the following factors: (A) the future level of the interest rate; and (B) the money value of the future net yield of the capital good, which in turn depends upon (1) the future price of the product, which in turn depends upon (a) the general level of prices and (b) the relative price of the product with unchanged production relations and changed demands; and (2) the amount of the product which accrues net to the entrepreneur,

which with unchanged demand varies with (a) the quantitative changes in the factors of production and (b) the general changes in the techniques of production, i.e., changes in the production functions.

Of these factors only two fall, properly speaking, within the sphere of monetary policy, viz., (A) the rate of interest and (Bla) the general price level. Lindahl did not consider that the rate of interest could play an independent role, for it must vary with the fluctuations in the real rate if severe maladjustments are to be avoided. That is to say, it must always be "normal." Hence, monetary policy is restricted to varying the price level to compensate for the changes in the other factors.

In discussing the proper price level policy, Lindahl distinguished between two groups of changes; (1) changes in the quantitative relations of the factors; (2) changes in the production function, i.e., in productivity.

Under changes in the quantitative relations of the factors he considered the following major cases: (a) no change in the quantity of factors of production, (b) proportionate changes in the quantity of factors of production; (c) nonproportionate changes in the quantity of factors of production but in the same direction; (d) the amount of labor decreases while the quantity of capital remains unchanged. The general position to which Lindahl came was that a constant price level would maintain the position of the borrower vis-à-vis the lender.

Under changes in the productivity of the factors of production, Lindahl's major cases are: (a) an unforeseen permanent proportional reduction in the productivity of the factors; (b) the permanent reduction in production varies with the factors of production; and (c) the change in productivity is of a transitory nature. Here, the general conclusion is that a price level varying inversely with productivity will be the best policy.

Lindahl saw clearly that the key to a smoothly functioning economic system lies in the promotion of an even flow of investment in our entrepreneurial economy. His method of assuming this even flow essentially implies, however, that the task of the Monetary Authority should be to assure that the capital value of the asset which secures the capital debt shall remain constant. This raises a fundamental question: will a policy which maintains the value of debt secure the stability of the economy? This bears

on the difficult problem of the factors which determine the flow of investment. Lindahl's assumption is that the inability to meet the burden of past debt will prevent the incurrence of present and future debt. What warrant is there for such an assumption? Surely the effect of technological progress will be to make obsolescent the investment in certain sectors of industry; but this does not imply that it will deter the flow of investment into the newly opened up sectors. May not an attempt to maintain as far as possible the value of past debt stimulate investment more than would be compatible with a stable system? Moreover, such a viewpoint implies that fixed costs determine output decisions, whereas modern theory emphasizes that output decisions depend upon marginal costs which are unaffected by the volume of fixed costs. Does it follow, then, that the maxim on which Lindahl's analysis is based, is false? The interesting fact is that Lindahl's conclusions can be accepted (or rejected) independently of this maxim.

Lindahl thus favored the program of Professor Davidson. Myrdal (who wrote in 1931), on the other hand, favored the stable price policy of Wicksell. He pointed out that Wicksell's theory of monetary equilibrium in a dynamic situation referred only to price relations but not to any absolute level of prices and in that sense both Wicksell and Davidson were wrong. None the less, any monetary policy aiming to preserve the equilibrium relations must adapt the flexible prices to the sticky ones. Hence the index he would stabilize would be one in which the individual prices are weighted (1) with respect to their stickiness of reaction and (2) with respect to their relative importance in the calculations of profitability by the entrepreneurs. The economic significance of such a hybrid index is not explained by Myrdal. It is doubtful whether it has any meaning.

Myrdal's point is, however, valid. The question of the price level is per se indeterminate, since its solution depends upon the primary conditions of monetary equilibrium. That is the essential cause of the conflict which raged over the question of the price level appropriate to monetary equilibrium. No conflict would have arisen if the primary conditions had been well defined.

The Problem of Conceptual Definition

A. The Natural Rate

The various controversies over the proper price policy have made clear the lack of clarity in Wicksell's theory of monetary equilibrium. In Geldzins, Wicksell's explanation of price movements depended upon the possibility of a divergence between two rates (or sets of rates); (a) the natural rate; (b) the interest rate. The natural rate represented the equilibrium demand price for capital while the interest rate represented the supply price for money. Unless the two were in balance with each other, cumulative movements in the price level would be generated.

Wicksell's notion of the natural rate was vague, as he realized. He defined it as the rate which would obtain if no use were made of money and all lending were effected in the form of real capital goods. This would also be the rate which would be neutral with respect to the price level.

Wicksell's frame of reference in Geldzins was a natural economy operating under static assumptions. His objective was the creation in the monetary economy of a structure which would correspond to that of the prototype economy. Wicksell required the monetary economy to have the same structure of relative prices as the natural economy.

In what way does the consideration of a natural economy cast any illumination upon the problems of a monetary economy? How, in a natural economy, can a uniform natural rate be established? The entrepreneurs borrow the goods in natura and contract to pay a certain amount including interest. But since there will be in general n different varieties of goods, then there will be in general n natural rates of interest. How can we obtain a uniform rate from these n natural rates?

If in our economy there existed only one commodity it would then be possible to determine a unique natural rate which serves as a yardstick for the interest rate in a monetary economy. But to assume such a situation is to limit severely the practicability of using a natural economy as a frame of reference. If, however, more than one commodity exists, the problem becomes insoluble unless the natural economy possesses a numéraire and pro-

vided that the price level in terms of this unit-of-account is constant. This is equivalent to assuming that relative prices are invariant. But these assumptions do not solve the problem, they assume the problem away. For the interest rate becomes neutral in a monetary economy only when money performs the function of a unit-of-account and when the price level is constant. Hence only under static assumptions can we find a unique natural rate. There then exists no genuine distinction between a natural and a monetary economy. Or, to put it in another way, the natural economy turns out to be a restricted form of the monetary economy. The result is that the natural rate depends upon the price-system; is not independent on it, as Wicksell postulated.

The problem of the natural rate was examined by both Lindahl and Myrdal. Lindahl took a negative position toward the concept while Myrdal sought to reconstruct it in such a way as to make it a dynamic concept and still be a unique rate.

Lindahl defined the natural or real rate as the relation between expected future yield per period and the capital investment during the period. On this basis he argued that it must always equal the interest rate since the market always capitalizes at the interest rate. Hence, the concept of the natural rate was useless as a tool of analysis. It is easy to show, however, that while the capital value of an investment is always equal to its future yields multiplied by the discount factor, it may be greater or less than its cost. It is the relationship between the two which determines the stimulus to investment.

Myrdal granted the inadequacy of Wicksell's natural rate concept but disagreed with Lindahl's dismissal of it. In Myrdal's redefinition of the natural rate, which he called the yield of real capital, he first introduced the distinction between ex ante and ex post, i.e., between anticipations of the future and actually attained results, or between the prospective and the retrospective.

The ex ante yield of real capital is decisive for the decisions of the entrepreneurs although it may be based on the ex post computation. It is defined as the ratio between the net return on the projected real investment and the cost of its production. The cost of planned investment will not, in the short run at any rate, be equal to the value of existing investment and it is the possibility of this inequality that stimulates Investment

and Disinvestment. This is precisely what the inequality of the natural and market rate does in Wicksell's system. Myrdal then interpreted monetary equilibrium to mean that the reproduction cost of planned investment equals the capitalized value of real capital for each enterprise in the economy. Is such a definition a useful one?

It will be in an economy in which no new investment is taking place but such an economy is a static economy. We have not advanced very far beyond Wicksell's dilemma if we accept this solution. Our unique rate still is unique only in a static society.

Another difficulty with Myrdal's concept of the yield of real capital is that it applies to the whole enterprise and not to the marginal unit of investment. Now, as Hammarskjöld pointed out, for Wicksell the natural rate was determined by the intersection of the supply and demand curves for loan-capital. The demand curve was equivalent to the curve of the marginal efficiency of investment. Given the supply curve, the natural rate becomes determinate.

The essential point is that only in a stationary state is the natural rate unique. When it is to be extended to be useful for dynamic analysis, it must be reconstrued as the function which represents the demand side of the (money) capital market. As such, it cannot be used as a sufficient condition for the determination of an equilibrium position. Another condition is necessary.

B. Saving and Investment

The condition of the equality of Saving and Investment appeared first in the Lectures. Wicksell did not need the condition in Geldzins since he operated with static concepts in which net saving and investment were excluded ex definitione. In Geldzins, the interest rate was normal when it was equal to the natural rate; in Lectures, when it was equal to the interest rate at which the demand for new capital is covered simultaneously by the simultaneous activity of saving. The capital which Wicksell had in mind in both Geldzins and Lectures was "free capital." This "free" capital is a subsistence fund in Geldzins, but in Lectures it becomes the intention of the savers to forego consumption.

Wicksell was groping toward a more dynamic system of concepts in Lectures, but he never completed the process.

Hence, a "cumulative process" in the price level develops when the demand for capital is greater or less than the supply at the existing interest rate. Normalizing the interest rate will equate the demand and supply for capital and stop the movement in the price level.

Lindahl, on the contrary, argued that an interest rate which does cause the price level to move always brings about an equilibrium between saving and investment within each period of time. The reason for this conclusion was that a change in the interest rate and the consequent movement in the price level bring such a redistribution in incomes that a new equilibrium within each period is attained. The conclusion is thus proto-Keynesian. There will necessarily exist in each period an equality of Saving and Investment for a change in the interest rate brings with it a change in investment which brings with it its appropriate saving.

Basic to Lindahl's analysis is the assumption that equilibrium prevails in each period. (This is the methodology adopted by Professor Hicks in his Value and Capital.) Hence, he was forced to exclude the possibility of a disequilibrium relationship.

Myrdal who made this criticism also made the following point: when the distinction ex ante and ex post is taken account of, it follows that savings and investment are always equal ex post but need not necessarily be equal ex ante. Hence, the Wicksellian condition of monetary equilibrium must be interpreted as involving the equality of savings and investment ex ante.

It is therefore the interrelationship of planned investment and planned savings which is decisive for the presence or absence of a "cumulative" process. Now this is for Myrdal the significant aspect of the Wicksellian theory of monetary equilibrium.

What follows from the above? What norm of policy follows from the equality of ex ante saving and investment? As Myrdal himself has shown, the requirement that ex ante savings equal ex ante investment does not permit us to derive some norm for monetary policy. Yet for Wicksell this condition did permit of the establishment of a norm, viz., a stable price level. Why is this so? The reason lies in the respective approaches to the problem.

Wicksell asked himself this question: what causes movement in the price level? He came to the conclusion that it was due to the disequilibrium between Savings and Investment, i.e., to the fact that more (or less) money is being loaned than is being saved. Myrdal has rejected this point of view and this approach. What Myrdal does is ask the following question: if I so define Savings and Investment that they are not necessarily equal, what can I say about the economic situation when they are equal. He cannot say very much for in his redefinitions of Saving and Investment he has introduced anticipations, and anticipations may be of various kinds. He is also forced to the recognition of the obvious fact that there may be monetary equilibrium in his sense and yet we may have the upward and downward movements which characterize a Wicksellian cumulative process. But the significance of the condition of the equality of ex ante savings and investment is supposed to be precisely the fact that it eliminated a Wicksellian cumulative process. We are apparently in a cul-de-sac. This, however, is not necessarily inevitable.

The significance of the Myrdal approach is that we are given a possible method of analyzing economic process, not necessarily the only method. In order to analyze economic process, we must start with the assumption that in a given economic context (to be specified) there exists disequilibrium between ex ante savings and investment, and then explore what the repercussions of this are upon the particular situation with which we have started. The method will be fruitful if it enables us to understand the actual movements of our economy. To the extent, then, that it will furnish us with a theoretical model (or models) of the "moving disequilibrium" of our economy, it will enable us to analyze the effects of changes in those variables which can be influenced by some outside authority.

This, then, is the legacy of Wicksell's monetary equilibrium. It furnishes us, not with a norm of monetary policy, but with a methodology of analysis for problems of economic process. This, in effect, was Myrdal's main conclusion. It is likewise that of Ohlin and Lindahl. Any methodology cannot be considered true or false per se, but upon the basis of whether it is useful or not. In order to establish the usefulness of the Wicksellian construct, we must proceed now to analyze the Wicksellian cumulative process.

The Cumulative Process

The cumulative process, as Wicksell conceived it, is an upward and downward movement in the general level of prices. It starts as a result of the disruption of monetary equilibrium and continues as long as the condition of monetary disequilibrium persists.

The cumulative nature of the Wicksellian process in Geldzins is shown in the following sequence of events. Some primary change takes place, e.g., a reduction in the rate of interest. This is reflected in the larger amount of ex post profits than anticipated at the end of the period in which the primary change occurred. Although in Wicksell's example these profits are not transferred to the next period, since by assumption they are consumed, nevertheless, what is transferred is the change in anticipations regarding the profit relationship. This is so, for although the price level is unchanged, the cost level has declined as a result of the fall of the interest rate.

Hence, investment plans at the beginning of Period II are increased as compared with those at the beginning of Period I. This increase in investment plans increases the demand for the factors of production, which increases their income, in this case by raising their prices. This increase in income then increases the demand for consumption goods, raising prices in that area. This rise in prices offsets the reduction in profitability occasioned by the rise in factor prices, thus stimulating further investment plans and so forth.

In Wicksell's example, the movement starts in the capital goods market, which then affects the market for factors of production, which in turn affects the market for consumption goods, which affects the market for capital goods and thus completes the circuit. The increase in investment decisions takes place at the beginning of the period. The increase in demand for the factors of production also takes place then although after the increase in investment decisions. On the other hand, the increase in demand for consumption goods takes place at the end of the period and affects the investment decisions made at the beginning of Period III.

It is basic to Wicksell's process analysis that the cumu-

lative process continues in the same direction as long as the monetary disequilibrium continues. Since Wicksell did not consider that the monetary disequilibrium would disappear as a result of the development of the process his cumulative process is in principle potentially endless. This is so because of the model with which Wicksell worked. There are four major assumptions which permit him to obtain the results he did: (1) the assumption of a fixed period of production; (2) the assumption of unitary elasticity of expectations, i.e., that present prices are future prices; (3) the assumption of fixed quantities of durable goods and working capital; and (4) the assumption of full employment. By assuming a fixed period of production, he was able to show in a series of short, easy steps the cumulative character of his process. By assuming unitary elasticity of expectations, he was able to show the endlessly cumulative character of his process so long as there were no outside obstacles to an increase in the supply of money. By assuming fixed quantities of durable and working capital and by assuming full employment he eliminated consideration of the possibility that the process would come to a natural end, i.e., that it would possess a limited cumulative character.

Two criticisms were made of the endlessly cumulative character of Wicksell's cumulative process. The first, by Professor Brock in 1909, contended that the cumulative process was not endlessly cumulative but would reverse itself; the second, by Professor Cassel in 1918, that it would end in a new equilibrium.

Professor Brock argued that a divergence between the two rates would lead to some disproportionality which would prove the undoing of the cumulative process. Over-investment would occur in some strategic industry relative to the rest of industry and would reverse an upward or downward cumulative process.

Why Wicksell ignored the problem is to be explained by his assumptions. He started with full employment of the factors of production and contended that no increase in production could take place, only a tendency to increase production. Moreover, the production period was assumed to be rigid. Substitution was impossible.

Cassel's criticism was based on the point that an unduly low interest rate would call forth an increased output of capital. The increased capital makes the interest rate an equilibrium rate.

Wicksell's reply to these criticisms was that they were

only secondary possibilities but not major factors. However, his reply was not satisfactory, and Professor Heckscher tackled the problem in 1921. His contribution was a notable one.

He assumed an increment to the monetary supply. If the increment accrues wholly to the entrepreneurs, then a new equilibrium will take place, because the entrepreneurs can now with the additional money compel a sufficient shift of the factors of production to the production of capital goods.

If, however, some of the increased money finds its way into the hands of the consumers, then this will provoke competition between entrepreneurs and consumers for the services of the factors. This produces a cumulative process. But the process is not endlessly cumulative nor will it reach a new equilibrium. It ends in a crisis and then reverses itself. This was Brock's position.

The major contribution to the theory of the cumulative process after Wicksell was made by Lindahl in 1930. He gave the Wicksellian Cumulative Process most of the major refinements that it required. Lindahl's analysis shows clearly that there can be no cumulative process per se, but that the process must vary with the initial conditions. What we are given, in other words, are Model Sequences.

The Lindahlian theoretical structure differs from the Wicksellian in four main points: (1) With respect to the concept of capital. Lindahl uses a capitalization approach whereas Wicksell used a real capital approach. (2) With respect to the concept of income. The differences here are again the differences between income as a flow of future money streams and a real income approach. (3) Lindahl eschews the Wicksellian concepts of natural and normal rates. (4) Lindahl assumes that the process is composed of a series of short period equilibria.

The first two do not constitute a fundamental breach with the Wicksellian system while the last two appear to. It will be recalled, however, that Lindahl rejected this part of Wicksell's system on the ground that a "natural rate" could not be uniquely determined except under special unrealistic conditions. Moreover, his analysis of the cumulative processes would not be altered significantly if his methodological device be dropped. Lindahl has stated, however, that if he were to re-write his work he would start with the assumption of an inequality between ex ante savings

and investment in the Myrdalian sense. Hence, this apparent partial revolt against an integral part of the Wicksellian structure turns out to be mainly verbal and to contain no essential break away from the original Wicksellian thesis.

So far as the first two differences are concerned, they are in the nature of improvements of the Wicksellian structure. Lindahl's concept of capital is a capitalization concept rather than a real concept and following logically from this is his ex ante concept of income. Wicksell, on the other hand, had employed almost to the last a concept of capital which thought of capital as a stock of goods--a particular type or kind of goods. The capitalization concept of capital does not differentiate between goods on the basis of their quality but rather in terms of: (a) the flow of services per period; (b) the prices of these services; (c) the number of periods or life of the good. Wicksell's concept of income, when expressed in monetary and not in real terms, was an ex post concept. People earned or received so much income and on the basis of these realized incomes acted accordingly. This raises the whole question of the relative utility of an apparatus of ex ante concepts versus an apparatus of ex post concepts. The basic assumption of both Wicksell and Lindahl is that present prices are future prices or the case of unitary elasticity of expectations. Ex ante and ex post systems of concepts which use this assumption approach one another, since the former uses the existing price data and the latter assumes that the existing price data will exist in the future.

Lindahl proceeded to analyze the effect of a reduction in the interest rate. The course of events will depend on the initial conditions, on whether full employment exists, on whether shifts of the factors take place quickly or slowly and so forth. Whether the final result will be a new equilibrium or a crisis will depend, Lindahl argued, on the nature of the anticipations, i.e., whether people expect present prices to be future prices or whether future prices are expected to be higher.

Exception may be taken to a number of his assumptions or the validity of the sequence of events he pictures as being let loose by a fall in the interest rate. But none of these blemishes can detract from the significance of his work. It is not on such single points that his work will stand or fall. It is rather the fundamental adequacy of his analysis as a whole that we must judge.

We can recognize the merits of his contribution but there must come a feeling of dissatisfaction with his work, not on the basis of what it has done but rather on the basis of where it has stopped--on the basis of what it has not done. The Wicksellian Cumulative Process is an instrument in analyzing process and Lindahl has shown what a supple instrument it is. But he has remained far too wedded to the traditional Wicksellian approach--the effect of a change in the interest rate upon the price level. Apart from the question whether a change in the interest rate is as effective as the Wicksellians assume, there is the point that a change in the interest rate is not the only change which would (theoretically) set into motion a cumulative process, e.g., a change in demand, a change in productivity. Nor is the price level necessarily the only or the most significant factor which will change cumulatively. There is the size of the national income, the volume of employment, the accumulation of capital, etc. Indeed, it may be argued that the price level is ordinarily the least significant of the factors subject to cumulative change. What would happen in an economy in which prices were rigid? Would this mean that a cumulative process was impossible? Obviously not.

How shall we explain Lindahl's limited approach? Wicksell attempted to make the cause of the cumulative process all-inclusive by attributing it to a divergence between the natural and interest rates. All disturbances other than a change in the interest rate would be included in the catch-all term, natural rate. The primary changes altered the natural rate and the lagging behind of the interest rate set into motion the cumulative process. Since Lindahl eschewed the terminology, this all-inclusiveness was not available to him. But there is another reason for his limited approach. Lindahl wrote his book to show how monetary measures could be used to carry out certain objectives of monetary policy. The instruments of monetary policy at the disposal of a Central Bank are the interest rates. The theoretical analysis was an indispensable prelude to show how changes in the interest rate affected the economy. With this analysis, the policy to be carried out becomes clear in the given circumstances. It is this limited goal that limits the scope of the analysis. A much wider range of problems is to be found in the writers in the period after 1932. This is largely to be attributed to the change in the

type of problem which has confronted the world. Lindahl's analysis is concerned with the problems that occupied the minds of the pre- and early post-war generation, viz., the relationship between the price level and the interest rate. It presents a certain lack of realism, even for these problems, because it ignores the institutional matrix of rigid and flexible prices, fixed contracts, etc. But his defense would be that these factors do not make any appreciable difference in the results.

Myrdal's treatment of the Cumulative Process, on the other hand, is very summary. He is far more interested in pointing out the general direction of the Process which will ensue as the result of a primary change in terms of his ex ante terminology. He points out correctly that if the price level is unaltered, the process will soon come to an equilibrium. To a certain extent, this conclusion is trivial since the Wicksellian cumulative process is defined as a movement of the price level of consumer goods. If we assume that the consumer price level is rigid, then the cumulative process ex definitione cannot occur. What is the value of such a definition? What of the case where the price level varies? Will that be endlessly cumulative? Or will it end in an equilibrium position? He does not give an answer to these questions. But no doubt this is due to his objective, which is to reformulate Wicksell's terminology in terms of a consistent and useful terminology rather than to deal in great detail with the Wicksellian cumulative process. He merely advanced these examples to illustrate how standard problems of process could be handled with his terminology.

We come now to a summing-up of the state of development of the Wicksellian cumulative process by 1932, i.e., for the periods covering the Wicksellian and neo-Wicksellian phases. As an introduction to the problem of process, its usefulness cannot be gainsaid, but as for furnishing us with a deeper knowledge, a more detailed understanding, its major deficiency would be its vagueness or perhaps more accurately its tendency to give in blurred outline the different stages of process. What is wanted is what Wicksell himself gave, some quantitative notion of the changes from period to period. To do this would require the greater use of mathematics and a more detailed knowledge of the empirical relationships in order to avoid the highly specialized assumptions of his case. What we have witnessed from the time of

Wicksell to the time of Lindahl is the development of a particular model sequence. With Lindahl we take a giant step forward and develop a series of alternate model sequences not one of which can be considered as much more than a first approximation. Now first approximations are essential in the orderly development of a science which seeks an isomorphic relationship with the actual sequence of events, but they are not the last approximations. Myrdal attempted to take account of the institutional background, but all he gave us were tendencies and the broad outlines of the process-development. The Wicksellian cumulative process had apparently reached a point of stagnation, a kind of relative cul-de-sac.

There would appear to be a fundamental reason which would account for the cul-de-sac which the Wicksellian cumulative process had reached by the time of Myrdal. This is the fact that the possibilities of development along traditional Wicksellian lines, even with a neo-Wicksellian terminology, had been about exhausted. New lines of attack were needed and new problems were necessary for fundamental advances to be made. In this sense, Myrdal represented a transitional figure, for he did introduce new ideas but did not carry out in detail the implications of these new ideas. He was still primarily concerned with the classical Wicksellian problems, viz., price level movements, the effect of a change in the interest rate, etc. One can say that the cumulative process in ideas which Wicksell started had reached an equilibrium in the persons of Lindahl and Myrdal. But an equilibrium in the development of ideas is necessarily a temporary if not an unstable one, and this was so with the Swedish writers. As a matter of fact, Myrdal's work was completed on the eve of the appearance in Sweden of a veritable spate of books dealing with the general problems of expansion and contraction in the economic system instead of with the restricted problems of movements in the price level. While this is the central theme which unites them, it cannot be said that they display the same uniformity in techniques of analysis; on the contrary, each one attempted to set up his own system, which was in the main an amalgam of neo-Wicksellianism and some other system, usually non-Swedish. It is for this reason that an appropriate name for them would appear to be the para-Wicksellians.

